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ABSTRACT

Questionnaire data from 81 North Carolina communities were analyzed in 1981 to test the hypothesis that 5 institutional subcategories (education, general community services, transportation, agricultural services, and health and sanitation) exhibit the underlying characteristic of unidimensionality and that they reflect comparable levels of differentiation. Guttman scales were constructed for all categories except agricultural services. Failure of the agricultural items to reflect a cumulative differentiation scale pattern left the possibility that most, if not all, of the items were nevertheless related to community differentiation; that agricultural service items were more related to the overall magnitude of agricultural production in the county; and that some commodity specific regional agricultural structures existed. Findings showed that county agricultural variables (including dairy processing plants, fruit packing plants, meat packing plants, vegetable canning plants, grain elevator and storage plants, poultry processing plants, and lumber mills/kilns) were better predictors than community variables for most agricultural processing services. Findings also supported the theory of the existence of some commodity specific regional agricultural structures. Conclusions indicated hinterland agricultural patterns may have considerable effects on certain community agricultural services and general urban differentiation and population size may have little or no relationship to their availability. A four-page reference list and nine data tables are appended. (NEC)

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Community Agricultural Processing Services:

A Reflection of Urban Differentiation or County Agricultural Structure*

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Abstract

This paper begins with a conception regarding differentiation that observable division of labor and institutional specializations represent a broader underlying social phenomena; the capacity of a system to process complex information types. An implication drawn from this view extended to a much stronger claim is that if differentiation is a general dimension that applies equally to all institutional sectors, any relationship between the differentiation within two given sectors should be tautological. The main hypothesis investigated here follows directly from this proposition. If differentiation is a general systems dimension, the relationship between community differentiation in general services, transportation, public service, educational and agricultural sectors should be tautological. This would imply that if one sector's institutions reflect a cumulative-scale-type development pattern then all sectors should since they would be operational measures of the same concept. Furthermore, the cumulative scales should be highly correlated. Contrary to similar assumptions in previous research, the results of this analysis indicate that community-based agricultural characteristics (processing services) do not reflect this cumulative urban differentiation pattern. The results of tests of two other hypotheses indicate significant relationships between the "magnitude of agriculture" and some agricultural processing services. In addition, relationships between some processing plants and the dominant local crop support the theory of a separate regional commodity social structure in the case of some commodities rather than a general agricultural structure.

Introduction

A review of the literature on community services in U.S. communities provides little comparable empirical research. In fact, our review indicates a sizable gap in the study of actual structural patterns of community services. Those studies of general services which have appeared in the last 15 years have dealt with surveys of community member's perceptions of services including "satisfaction" (Molnar, 1979 and Molnar and Smith, 1982), "quality" and "availability" (Christenson, 1976), and "adequacy" (Warner and Burdge, 1979). Some studies have been concerned with single sectors such as retail activity (Johansen and G. V. Fugitt, 1973). Most of the recent published research on the structural patterns of institutional organizations, agencies, and services has been done on communities by cross- culturally oriented sociologists on non-U.S. samples (e.g., Kaplan, 1974; Spencer, 1973; Young and Young, 1973). Some research on the configuration of U.S. services has been done at the county level, but most of it is unpublished (see Stuby, 1979 on these studies). Moreover, to our knowledge there has been no published sociological research focused on the patterns of community based agricultural services in the last two decades. As with many of the cross-cultural studies on actual patterns of community services mentioned above, this report now turns to a consideration of their "differentiated" nature.

While August Comte discussed differentiation, it is Emile Durkheim's work on the division of labor which is more widely known and cited in current sociological literature. There are, of course, different interpretations of Durkheim especially as to how he viewed the place of population, interdependence and division of labor in sociological explanation (Pope, 1973).

Early human ecologists saw differentiation as somewhat analogous to the evolutionary specialization in the development of species. As a result, they were more concerned with micro-specializations within the community than the more global community perspective. Later, macro-community ecological views emerged which tended to take a spatial functional specialization perspective which perceived communities as divided into functional zones, sectors, or social areas (Harris and Ullman, 1957). Central place theorists introduced the idea of "nested systems" (Johnson, E.A., 1970). In this view each community is surrounded by a set of other communities which have fewer specializations than the central community which is also generally considered to be larger. That larger community is also one of the communities of the set in the periphery or hinterland of a larger central community which has even more specialty services. The explanation of any failure of regions of cities to conform to this model is mostly based on the lack of equality in both resources and "economic distance" between community centers. This perspective implies a positive relationship between community/and hinterland size and the internal differentiation of community services (or functions). It is quite compatible with capitalist (free market) economic theory and not incompatible with the pattern of community differentiation examined later in this paper although the conceptual interpretation examined herein is quite distinct.

The community patterns hypothesized by the human ecologists were mainly descriptive rather than explanatory and have not held up to cross-cultural or indeed intra-national comparisons. Central place theory, while displaying greater explanatory power for current stable patterns, does not account for local community system dynamics which may effect change such as communal efforts. For some theorists the consideration of locality forces is illogical since all change is conceived of as originating from external causes. Yet how does one account for the fact that some communities become

leading growth centers and others fall behind? Even more complicated is the realization that some high growth center's decline and others, overtake them. There is no adequate causal explanation of the internal sociopolitical dynamics of historical development in central place theory. Rather there is usually a post hoc particularistic explanation having to do with the environmental advantages which must have existed at the growth points.

There is another paradigm, however, which attempts to account for observed local community efforts toward development. The basic view has an underlying assumption of inter-community competition, among communities which are interrelated within some region usually referred to as an inter-village system or community network. The concern with "development" is taken to mean "structural differentiation." We are referring to the "symbolic structuralists" discussed by McCannell (1979), but only their conception of differentiation will be discussed here.

Durkheim's general notion of the division of labor is a starting point, but such observable specializations are reinterpreted as reflecting an underlying phenomenon: "the capacity of a system to process complex information types" (Young, 1966). In another work Young and Fujimoto (1965) extend this conception to claim that if this capacity is a systems capacity (i.e., "a general dimension") then the differentiation of any two sectors will be tautological. In other words, the level and development of differentiation should be reflected across all subcategories of the institutional development of a community such that a measure of differentiation in any area of specialized roles and institutions is approximately interchangeable with any other area for purposes of determining the level of community differentiation. Differentiation measures index the degree of the system's underlying capacity to process a wide range of complex social information types.

The implication of the above is that complexity or specialization in each category of institutions (or community services) will progress in such a way so that at any point in time there will be general comparability of levels of differentiation. With this theoretical explanation and set of assumptions one would expect, for example, that the complexity and sophistication in the area of general community services would be closely paralleled by the areas of health, transport, and educational services. Presumably if any area did not meet this requirement one would be forced to reformulate the conception of the differentiation phenomenon or adequately explain the exception.

Several empirical studies can be considered conceptual forerunners and are somewhat similar to the present research. Young and MacCannell (1967) studied 72 New York State communities. By coding aerial photographs they developed a Guttman Scale as a measure of differentiation based on observable variations in community infrastructure. They also constructed several other measures of "community complexity," found them highly intercorrelated and discussed the idea that they may be interchangeable measures of the same phenomena. MacCannell (1968:52) in a study of differentiation patterns in the 48 states raised the question, "Is there, within or 'above' all this specialization a single, measurable dimension, 'the development of agriculture'?" He then analyzed state agricultural characteristics and found that they fit a cumulative Guttman scale pattern. As he says, "The scale is initial evidence for the participation of agriculture in the general process of development." Kaplan (1969; 1974) studied 180 Philippine communities. Village crop and animal practices were surveyed. These were analyzed and found to fit a cumulative Guttman Scale pattern. They also correlated with scales of the differentiation of community commerce, health, and local government. The general theme in these studies is that increased community

capacity to process a variety of societal information types would be reflected in all areas including agricultural roles and institutions.

In this study, community items from five institutional subcategories are analyzed to test the hypothesis that they exhibit the underlying characteristic of unidimensionality and that they reflect comparable levels of differentiation. The items are structural characteristics and consist of publicly visible institutionalized group activities (often called organizations or agencies) or the outgrowth of corporate group activities (structures) such as elderly housing or a museum. The community subcategories include education, general community services, transportation, agricultural services, and health and sanitation. While this type of analysis has been done in past research, community level agricultural services have not been tested for such dimensionality. The last part of this paper explores hypothesized predictors of community agricultural services including the scale (magnitude) of agricultural structure and commodity structure.

Sample and Data Collection

In order to acquire up-to-date information concerning these structural characteristics a mail questionnaire was addressed to key informants within two types of communities in each county in North Carolina in 1981. The selection of which communities to survey was based on an interest in two regionally visible structural phenomena: size and political status (county seats). County seat status has historically favored the location of educational, health, welfare, and governmental services. Being the largest community may also favor the location of services in a county. Supplementary questionnaires were addressed to both mayors and city clerks of the county seats. If the county seat happened not to be the largest city, questionnaires were sent to mayors and city clerks of the largest city in the county. The

survey target sample for this analysis included 100 communities (1 for each county, either the county seat or largest place). Seventy are county seats.

With some minor modifications the "total design" survey method was followed (Dillman, 1978). Mayors and city clerks were chosen because it was assumed that both of these positions involve an extensive and recent familiarity with the community. Support for these notions plus a model for a similar data collection effort are provided by Eberts and Kelley, (1984).

The usable questionnaire returns yielded an N for this analysis of 81 communities. The actual analysis sample is sometimes further reduced, however, because of incomplete, unreadable, or missing data for certain survey questions and suppressed or unabailable data from census sources.

Analysis and Results

The analysis strategy in this paper begins with the construction of alternative measures of differentiation and the exploration of their relationships. Guttman scales are constructed for general community service differentiation, educational differentiation, public service differentiation and transportation differentiation. An attempt to construct a unidimensional agricultural services scale was also undertaken.

The Guttman scale is a procedure for determining whether questionnaire or data items belong to unique (unidimensional) substantive areas and for arranging the items in a single rank-order measure. Items must satisfy the criteria which define a Guttman scale (see Guttman, 1944; Chilton, 1969). Given this, the components of the scale are assumed to measure a single underlying dimension. Generally items which form a scale must meet the criteria of cumulativeness in order of frequency and must exhibit such a pattern with little deviation (low error rates).

In this research multiple indicators (of the presence of particular organizations, services or institutions) have been scaled and yield rankings of the sample communities. We attempt to construct five different scales and are successful with four, each in a different service area.

Two criteria are utilized to show the degree to which a group of items form a reliable dimension. The first of these is Guttman's coefficient of reproducibility which should attain a level of .90 or better to indicate an acceptable scale. This coefficient is simply a measure of the extent to which a scale score is a predictor of an errorless scale pattern (Guttman, 1944). The second criterion is the coefficient of scalability divised by Menzel (1953) which adjusts for extreme marginals. According to Menzel, the coefficient of scalability varies from zero to one and should exceed .60 if the scale is to be accepted as unidimensional.

Measurement: Community Differentiation Scales

Community Services Differentiation Scale. This 12 item scale, shown in Table 1, is composed of community services ranging from those found in most communities to those least likely found. The scale arranges the characteristics in a cumulative differentiating scale. In this instance the most basic community service to emerge is municipal lighting, which all of the communities provide. Universal items are listed for information and to illustrate baseline development levels, although they do not increase scale discrimination.* Banks and garbage collection were the next most frequently provided service followed by library services, day care, parks, chamber of commerce, public works, planning department, paid fire department, health department, social services department, mental health departments and finally a public

*These items were not included in the scale analysis process.

health board, which only 47% of the communities provided. The degree to which this scale achieves a reliable single dimension is represented by the scalability coefficient (.74) and the reproducibility coefficient (.95).

Health and Social Services. This six item scale in Table 2 progresses in complexity from a community in which a sanitary water system is provided (100% of the communities provide this service) to communities that provide elderly housing (73%) and youth centers (46%). Those communities that provide youth centers also tend to provide all the other services on the scale. Other services include (in order of most to least provided) a primary health care clinic; a prenatal care clinic; a post natal care clinic; a hospital; and a nursing home. Like the community services scale, this scale also meets the minimal scalability and reproducibility levels.

Educational Scale. This scale (see Table 3), has eight items and distinguishes the level of community development of educational institutions (development in terms of continued complexity). The scale ranges from those communities that provide the most basic educational services - elementary education - to those that provide, in addition to the other educational institutions, a four year college (18% of the communities). In our sample, those communities that provide a four year college are likely also to provide an art gallery, museum, theater, community college, vocational training and handicapped programs. Again this scale meets the minimal statistical requirements.

Transportation Scale. This scale (Table 4) is intended to differentiate the development of transportation phenomenon by communities. The transportation item occurring most is "paved roads that connect the community to another community." One hundred percent of the sample reported this item. The least developed transportation item is an airport with regularly scheduled

flights by airlines (14% of sample). Within this scale one may assume that taxi services indicate a less complex transportation system than the city bus service, and the freight train service likewise indicates a less complex development than trucking services. This scale is well within the limits of acceptable scalability.

Agricultural Processing Services. Given the possibility that there may be subdimensions within the total range of agricultural services (e.g., input services and output services) it was decided to focus only on the processing services. This seemed to suggest a better chance of isolating a coherent scalable set. Then too these are large and more easily observable given the great number of large and small services which go into the maintenance of farms, farm households, and the actual production inputs to crops and livestock. The results of this scale analysis in Table 5 may be called a quasi-scale. It attempts to relate the degree of agricultural service complexity in communities to a cumulative rank order pattern. This display of items is the closest we could come in devising a scale. It is the one scale that did not meet the requirements of scalability and is thus unacceptable as a measure of the differentiation of agricultural services. High error items in the scale were removed one at a time with insufficient scale improvement.

The research question now becomes: why is it that the agricultural items do not scale and do not follow the general community differentiation pattern? Some hypotheses regarding this question are explored in the analysis to be described subsequently.

Analysis of Relationships

In looking at the correlation matrix among scales based on the total sample of communities in Table 6 we see that each of the scales is significantly and positively related to the others. This would be expected

given the assumption of differentiation as a unidimensional aspect of social development, that as communities become more differentiated in one social sector (like commercial services) they likewise show a similar development in all other areas. What we would not expect is to find institutional categories where the development is not similar to the others. As we saw, such is the case with agricultural development. Why the agricultural sector does not seem to follow the other sectors and what is influencing this sector to follow another pattern becomes a major research question in this analysis. To simply argue that they are qualitatively different begs the question.

Table 6 indicates levels of correlation among scales which are about the same levels as those in previous cross-cultural research on community differentiation (Young and Young, 1973; Kaplan, 1974; Spencer, B.A., 1973). The Youngs found further evidence for an equal content area for their scales using smallest space analysis despite intercorrelations at about the magnitude we have here (Young and Young, 1973). For purposes of our concern with agricultural services in this paper we proceed, assuming that Table 6 presents sufficient evidence that these four scales are measuring the same phenomena. This leaves the agricultural scale as an anomaly.

Since the agricultural items do not form a scale, it may be that measurement error in only a few of the items is to blame. If so, most of the scale items should show correlations with the other scales (see Table 7). However, the results of the test of this hypothesis are not encouraging. Only three of the seven plants ("Dairy Processing Plant," "Fruit Packing Plant" and "Meat Packing Plant") show any significant relationships even at the .05 level and, in terms of magnitude only these three show correlations above .25. "Dairy Plants," however, is convincingly related to all four differentiation scales.

But the general hypothesis is unsupported in 20 of 28 correlations in the table.[1]

A test to detect any influence of more general overall community development utilized 1980 population size. Population size was not significantly related to the occurrence pattern of any of the agricultural service items.

Another plausible hypothesis is that the complexity of the agricultural institutional base already present will predict the probability of additional processing services. To test this an "Agricultural Processing Score" was determined for each community based on the shear number of processing plants present other than the one being used as the dependent variable. No combination of 6 plant types was capable of significantly predicting the remaining type.

Given the almost complete lack of relationship between the agricultural items and the differentiation scales another hypothesis is possible. One of the ever present problems in structural research is the distinction between systems levels. A steel mill or airplane factory are not usually considered to be community characteristics, but characteristics of nations. It could be that agricultural processing services are characteristics of counties and tend to be present only in communities in counties with widespread agricultural production bases. To test this hypothesis twelve county agricultural characteristics were selected from the Agriculture Census as alternative measures of the scale (magnitude) of agriculture (Table 8). The summary measures include total farms, total harvested cropland, total value of crops, and numbers of

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[1]These analyses use SAS (1982) statistical package the "Pairwise Deletion" of variables option so that each correlation deletes cases without complete data in each correlation. Therefore, N varies somewhat in these analyses.

farms classified by market value of products sold.[2] The first three have been shown to fall into factors relating to the scale of Agriculture (Wimberley 1980, 1981). To tease out possible relationships to different types of farming patterns (e.g., mainly large farms, mostly middle-size farms, or mostly small farms) several categories of total farm sales were also included.

As can be seen by inspection of Table 8, there is some support for the hypothesis that the magnitude of agriculture influences the presence or absence of agricultural processing services. This appears to be true especially for "vegetable canning plants" and "meat packing plants." "Grain elevator and storage plants" are positively related to counties which tend to have farms with sales valued at $100,000 or more, $40,000 to $99,000, and $20,000 to $39,000. Such plants are not at all related, however, to the number of farms in the lower production value ranges. Thus the occurrence pattern of three out of seven processing plants appears to be substantially related to the magnitude of general agricultural activity in a county.

Another hypothesis suggested by the work of R. Young (1976) on Caribbean Agriculture is that different commodities are imbedded in quite different social structures rather than a single "structure of agriculture." This is also supported by Young's work in factor analysis of New York State county data which yielded factors containing clusters of variables related to commodities and their social and economic agricultural structure (R. Young, 1981). Thus we hypothesized that counties often are dominated by a few commodities and that measures of the magnitude of agriculture by commodity would predict the occurrence of appropriate processing facilities for that

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[2] These county agricultural characteristics are all highly correlated with each other. None correlate less than .95 with any of the others.

commodity. Counties ranking higher on a given commodity would more likely have an appropriate plant.

This hypothesis is examined in Table 9. For each processing plant the set of variables relevant to that commodity by county (from the U. S. Agricultural Census) was run against the presence of a processing plant. Typically only four variables relevant to a given commodity are available in the census, although for "meat packing" there were six. Interestingly "vegetable canning plants," "meat packing plants," and "grain elevator and storage plants" are the items showing influence of commodity variables. The evidence is most convincing for "vegetable canning plants" with four items related at the .001 level of significance. The "grain elevator and storage plants" item indicates consistent evidence also with three items and the only item negatively related (V21) is not a grain item ("field seed and hay" totals). "Meat packing plant" is related to three of the six items, but the correlations are weaker on the average than for the other two. Nevertheless, there is sufficient evidence to suggest that the type of commodity is related to three of the seven types of processing plants.

Discussion

The initial objective of this research was to test the hypothesis that community structural differentiation ["the capacity to process complex information types," (Young, 1966; Young and Young, 1973)] could explain the differentiation pattern of community based agricultural services. In fact, community agricultural processing services failed to form a scale pattern like the other service sectors suggesting that as a group they do not reflect the more general community differentiation pattern.

The failure of the agricultural items to reflect a cumulative differentiation scale pattern left the possibility that most, if not all of the items,

were nevertheless related to community differentiation. A test of this notion indicated that only three of the scale items exhibited a significant relationship to any of the four differentiation scales. However, dairy processing plants were significantly related to all four scales indicating that it fits the general urban service differentiation pattern.

Another hypothesis was then pursued that agricultural service items are more related to the overall scale (magnitude) of agricultural production in the county. Several measures of agricultural scale (magnitude) were employed. The "vegetable canning plant," "meat packing plant," and "poultry processing plant" were convincingly related to the magnitude of county agriculture.

The specialized structural categories of general community services, health and social services, transportation, and education all reflect the general urban phenomena of cumulative differentiation. It is clear, however, that urban located agricultural services in general are not interrelated with the overall cumulative differentiation pattern typical of local community services. Six of the seven stand alone as independent phenomena. They are even unrelated to the development of transportation services, which reflect potential regional connections and interchange between a community and a greater hinterland. Four plants are also unrelated to the magnitude of general agricultural activity in counties, but three ("vegetable canning plants," "meat packing plants," and "grain elevator storage plants") are significantly related.

Findings also offer support to the theory of the existence of some commodity specific regional agricultural structures. Evidence supports the notion that "vegetable canning plants," "meat packing plants," and "grain elevator and storage units" are part of a commodity specific agricultural structure in counties with large scale production of these crops.

Three types of processing plants, "fruit packing," "poultry processing," and "lumber mills-kilns" are apparently unrelated to community differentiation, the general magnitude of county agriculture, or commodity dominance. It is probable that "lumber-mills kilns" are not related to agricultural farm patterns since a great deal of lumber comes from other non-farm industrial forest enterprises.

While four of the seven agricultural processing items were significantly related to one of the hypothesized independent variables, a common logic generalizable to the location patterns of all processing plants has not yet emerged. Indeed, there may not exist a common predictor for all. However, the socioeconomic organization of agriculture by magnitude and by commodity specific activities seems to be the most promising line of research to pursue for most processing services. A high level of accurate prediction across plant types may ultimately only be possible with a multi-variable and multi-system level solution but we have at least begun to identify some of the important relationships. Another possibility is that each plant type will be highly predicted by a different combination of factors. Explanation and prediction sophistication could eventually aid in more reasonable plant locations and in understanding the macro conditions which most strongly affect agricultural processing institutions.

With regard to system level considerations, it would, of course, be easier in all research problems such as this if the "real interaction unit" of analysis' boundaries were adequately delineated. However, given the fact that the "real" social or economic boundaries of communities, cities, or metropolitan regions are not well established by appropriate analyses, it is not heuristic to delay research on such services until boundaries to such entities as distinct "agricultural regions" can be scientifically established and agreed upon. Until then we will be constrained by practical

considerations to use census "places" and politically defined communities, counties, and states or some combination of these.

It has at least been shown that these county agricultural variables are better predictors than the community variables for most agricultural processing services. Therefore, it seems that agricultural processing services should be further studied utilizing data on units at this level. However, it is likely that ignoring community level variables for all locality based agricultural services (e.g. agricultural input services) would be a mistake, since this exploratory research has indicated the lack of simple small to large, rural-urban, or urban-agricultural interrelationships. What does seem apparent is that hinterland agricultural patterns may have considerable effects on certain community agricultural services and general urban differentiation and population size may have little or no relationship to their availability. It may be that other urban structural patterns are therefore also affected by agriculture. Such studies are needed to determine the effects of changing agricultural structure on communities in America.

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Table 1

Scale of Community General Services

Scale Step	Percent of Sample Discriminated	(Non-profit Agencies)	Errors
I	47	Public Health Board	2
II	50	Mental Health Board	2
III	52	Dept. of Social Services	4
IV	53	Department of Health	3
V	67	Paid Fire Department	15
VI	79	Planning Department	15
VII	84	Chamber of Commerce	7
VIII	87	Parks Department	4
IX	92	Day Care Center	2
X	97	Library	0
XI	99	Banks and Garbage Collection	0
XII	100	Municipal Street Lights	0

Coefficient of Scalability = .74

Coefficient of Reproducibility = .94

Table 2

Health and Sanitary Services Scale

Scale Step	Percent of Sample Discriminated	Items	Errors
I	46	Youth Center	2
II	73	Elderly Housing	6
III	82	Nursing Home	5
IV	86	Hospital	5
V	94	Post-Natal Care Clinic	2
VI	95	Prenatal Care Clinic and Primary Health Care Clinic	3 1
VII	100	Sanitary Municipal Water System	0

Coefficient of Scalability = .72

Coefficient of Reproducibility = .96

Table 3

Educational Institutions Scale

Scale Step	Percent of Sample Discriminated	Items	Errors
I	18	Four-year College	8
II	33	Art Gallery	7
III	43	Museum	15
IV	62	Theater	9
V	75	Community College	10
VI	92	Vocational Education Facility or Program	8
VII	97	Special Education for Handicapped Facility of Program	12
VIII	100	Public or Private Elementary	0

Coefficient of Scalability = .66

Coefficient of Reproducibility = .91

Table 4

Transportation Scale

Scale Step	Percent of Sample Discriminated	Items	Errors
I	14	Airport with Regularly Scheduled Airlines	1
II	18	Passenger Train	7
III	28	City Bus Service	8
IV	48	Trucking Terminal	8
V	62	Airport (Private or Charter Flights)	7
VI	69	Freight Train Service	9
VII	75	Taxi	3
VIII	97	School Bus Service	Ø
IX	100	Paved road connecting community to at least one other community	Ø

Coefficient of Scalability = .76

Coefficient of Reproducibility = .94

Table 5

Agricultural Processing Services

Scale Step	% of Sample Discriminated	Items	Errors
I.	8	Vegetable Canning Plant	4
II.	13	Fruit Packing Plant	10
III.	16	Poultry Processing Plant	7
IV.	20	Dairy Products Processing Plant	7
V.	25	Grain Elevator or Storage Plant	19
VI.	32	Meat Packing Plant	13
VII.	66	Lumber Mills-Kilns which process timber into lumber	11

Coefficient of Scalability = .54

Coefficient of Reproducibility = .88

Table 6

Relationships Between Community Differentiation Scales

	EDSTEP	TRANSTEP	COMSTEP	HEWSTEP
EDSTEP	1.00			
TRANSTEP	.55*	1.00		
COMSTEP	.42*	.38*	1.00	
HEWSTEP	.34*	.46*	.38*	1.00

*p < .01

Scale Identification:

Edstep = Educational Institution Scale

Transtep = Transportation Developmental Scale

Comstep = Community General Services Scale

Hewstep = Health and Sanitation Services Scale

Table 7

Correlations Between County Differentiation Scales
and County Agricultural Processing Services*

	EDSTEP	COMSTEP	TRANSTEP	HEWSTEPS
DAIRY[a]	.47**	.25*	.35**	.31*
PACKPLANT	.37**	.06	.02	.27*
CANPLANT	.21	.15	.20	.21
MEATPLNT	.29*	.23	.34**	.15
POULPLNT	-.02	-.17	-.07	-.13
GRAIN	-.09	.02	-.10	-.07
LUMBER	.21	.19	.18	.10

* < p.05 N = 59
**< p.01

[a]for meaning of variables see discussion of agricultural scale above

Key
EDSTEP = Educational Institution Scale
COMSTEP = Community General Services Scale
TRANSTEP = Transportation Developmental Scale
HEWSTEPS = Health and Sanitation Services Scale
DAIRY = Dairy Products Processing Plant
PACKPLANT = Fruit Packing Plant
CANPLANT = Vegetable Canning Plant
POULPLANT = Poultry Processing Plant
GRAIN = Grain Elevator or Storage Plant
LUMBER = Lumber Mills-Kilns which process timber into lumber

Table 8

Correlations Between Agricultural Scale Items
and General Agricultural County Characteristics

	DAIRY	PACKPLNT	CANPLNT	MEATPLNT	POULPLNT	GRAIN	LUMBER
V1			.32**	.24*			
V2			.34**	.26*		.23*	
V3			.34**				
V4			.32**	.23*			
V5			.34**	.26*		.23*	
V6				.34**		.33**	
V7		-.23*	.37***	.39**		.34**	
V8			.39***	.23*		.31**	
V9			.30*				
V10			.29*				
V11							

*P < .05
**P < .01
***P < .001

Note: Only levels of significance greater than or equal to .05 are reported above (N=70)

Key

V1 = Total Farms 1978
V2 = Total Farms $2,500 + 1978
V3 = Harvested Cropland 1978
V4 = Total Value of Crops 1978
V5 = Market Value of Products Sold Farms $2,500 + (1978)
V6 = Market Value of Products Sold Farms: $100,000 + 1978
V7 = Market Value of Products Sold Farms: $ 40,000 to $99,999 1978
V8 = Market Value of Products Sold Farms: $ 20,000 to $39,999 1978
V9 = Market Value of Products Sold Farms: $ 10,000 to $19,999 1978
V10 = Market Value of Products Sold Farms: $ 5,000 to $ 9,999 1978
V11 = Market Value of Products Sold Farms: $ 2,500 to $ 4,999 1978

DAIRY = Dairy Products Processing Plant
PACKPLANT = Fruit Packing Plant
CANPLANT = Vegetable Canning Plant
MEATPLNT = Meat Packing Plant
POULPLANT = Poultry Processing Plant
GRAIN = Grain Elevator or Storage Plant
LUMBER = Lumber Mills-Kilns which process timber into lumber

Table 9

Correlation Among Selected Agricultural Processing Services and Relevant Agricultural Commodity Variables[a]

DAIRY		PACKPLANT		CANPLANT		MEATPLANT		POULPLANT		GRAIN		LUMBER	
V1	.27	V5	-.05	V8	.40***	V2	.03	V13	-.11	V18	.36***	V22	.01
V2	.08	V6	.05	V9	.35***	V12	.16	V17	-.12	V19	.40***	V23	.11
V3	.12	V7	.04	V10	.45***	V13	.20	V14	.01	V20	.39***	V24	-.01
V4	.11			V11	.43***	V14	.25*	V16	.04	V21	-.19	V25	.09
						V15	.30**						
						V16	.27*						

*P < .05 **P < .01 ***P < .001

[a]Underlined correlations have variables with N's below 65 counties in the Ag Census

Item Description Key for Table 9

Dairy:
- V1 = Dairy Products Sold Total Value $2,500+ [1978] (N=36 counties)
- V2 = Cattle and Calves Sold Total Value $2,500+ [1978]
- V3 = Value of Products Sold Dairy [1974]
- V4 = Dairy Products Total # of Farms With Sales $2,500+ [1978]

Packplant:
- V5 = Fruit Total Value Sold $2,500+ [1978] (N=28 counties)
- V6 = Fruit Total # of Farms With Sales $2,500+ [1978]
- V7 = Value Products Sold Fruits and Nuts [1974]

Canplant:
- V8 = Vegetables Total Value Sold $2,500+ [1978] (N=54 counties)
- V9 = Total # of Farms With Crop Sales $2,500+ [1978]
- V10 = Vegetables Total # of Farms Sales $2,500+ [1978]
- V11 = Value of Products Sold Vegetables [1974]

Meatplant:
- V2 = Cattle and Calves Total Value $2,500+ [1978]
- V12 = Cattle and Calves Total # of Farms With Sales $2,500+ [1978]
- V13 = Livestock and Poultry Products Total Value $2,500+ [1978]
- V14 = Livestock/Poultry Products Total # of Farms With Sales $2,500+ [1978]
- V15 = Hogs and Pigs Total # of Farms With Sales $2,500+ [1978]
- V16 = Value of Products Sold Livestock and Poultry [1974]

Poulplant:
- V13 = Livestock and Poultry Products Total Value $2,500+ [1978]
- V17 = Poultry/Poultry Products Total # of Farms With Sales $2,500+ [1978]
- V14 = Livestock/Poultry Products Total # of Farms With Sales $2,500+ [1978]
- V16 = Value of Products Sold Livestock and Poultry [1974]

Grain:
- V18 = Grain Total # of Farms With Sales $2,500+ [1978]
- V19 = Grains Total Value Sold $2,500+ [1978]
- V20 = Value of Products Sold Grains [1974]
- V21 = Field Seed and Hay Total # of Farms With Sales $2,500+ [1978]

Lumber:
- V22 = Woodland Pastured Farms Total # [1974]
- V23 = Woodland and Pastured Acres Total [1974]
- V24 = Woodland Pastured Farms Total # With Sales $2,500+ [1978]
- V25 = Woodland Pastures Total Value $2,500+ [1978]